

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Canceled)

2. (Currently Amended) A filter device comprising:

a filter cylinder;

a plurality of hollow fiber membranes, each having a bundled end bundled into a bundled-end diameter and a free end, and said free ends arranged to spread within said filter cylinder, wherein the cylinder has an inner diameter between 1.5 and 3 times the bundled-end diameter; [[and]]

injection means for injecting fluid and gas to a central portion of said plurality of hollow fiber membranes and causing the fluid and gas to radiate outwardly from the central portion, thereby injecting the fluid and gas to an interior of said filter cylinder under pressure[[,]];

a funnel member beneath the plurality of hollow fiber membranes; and

a recovery chamber inside the filter cylinder and below the funnel member,

wherein the gas floats within said filter as bubbles and spreads said plurality of hollow fiber membranes outwardly, and

deposits on the outer periphery of said plurality of hollow fiber membranes are removed therefrom by action of the fluid and the gas.

3. (Canceled)

4. (Currently Amended) A filter device comprising:

a filter cylinder;

a plurality of hollow fiber membranes, each having a bundled end bundled into a bundled-end diameter and a free end, and said free ends arranged to spread within said filter cylinder, wherein the cylinder has an inner diameter between 1.5 and 3 times the bundled end diameter; and

injection means for injecting fluid and gas to a central portion of said plurality of hollow fiber membranes and causing the fluid and gas to radiate outwardly from the central portion to agitate the hollow fiber membranes; [[and]]

a funnel member disposed below said plurality of hollow fiber membranes and narrowing in a downward direction[[,]]; and

a recovery chamber inside the filter cylinder and below the funnel member;

wherein the gas floats within said filter cylinder as bubbles and spreads said plurality of hollow fiber membranes outwardly, and

deposits on the outer periphery of said plurality of hollow fiber membranes are removed therefrom by vibration caused by the fluid and the gas,

the deposits thus removed precipitate in the funnel member due to a difference between the specific gravity of the precipitate and the fluid.

5. (Currently Amended) A filter device according to claim 4 wherein further comprising:  
a the recovery chamber is adapted to recover in said cylinder and disposed below said funnel member, ~~thereby the deposit precipitated in the funnel member is recovered in the recovery chamber.~~

6. (Canceled)

7. (Previously Presented) A filter device comprising:  
a vertically disposed filter cylinder;  
a funnel member narrowing in a downward direction and arranged within said filter cylinder;

a filter chamber in said cylinder and disposed above said funnel member;  
a recovery chamber in said cylinder and disposed below said funnel member;  
a plurality of hollow fiber membranes, each having a bundled end bundled into a bundled-end diameter and a free end, and said free ends arranged to spread flexibly within said filter cylinder, and said plurality of hollow fiber membranes disposed above said filter chamber, wherein the cylinder has an inner diameter between 1.5 and 3 times the bundled end diameter; and

injection means for injecting fluid and gas to a central portion of said plurality of hollow fiber membranes and causing the fluid and gas to radiate outwardly from the central portion thereby injecting the fluid and gas to an interior of said filter cylinder; and

a backwash chamber disposed above said filter cylinder to temporarily store filtrate fluid permeated through said plurality of hollow fiber membranes,

wherein the gas floats within said filter cylinder as bubbles and spreads said plurality of hollow fiber membranes outwardly, and

deposits on the outer periphery of said plurality of hollow fiber membranes are removed therefrom by vibration caused by the fluid and the gas,

the filtrate fluid temporarily stored in said backwash chamber is pressurized to flow into said plurality of hollow fiber membranes and go out from said plurality of hollow fiber membranes into said filter cylinder.

8. (Canceled)

9. (Previously Presented) A filter device according to any one of claims 2, 5, and 7, wherein said injection means is structured with an injection pipe penetrating a bottom surface of said filter cylinder and inserted through a lower end opening of said funnel member to reach the central portion of said plurality of hollow fiber membranes.

10. (Previously Presented) A filter device according to claim 9, wherein the inserted end of the injection pipe is disposed between one-third and two-thirds down the length of the plurality of hollow fiber membranes.

11. (Previously Presented) A filter device according to any one of claims 2, 4, 5, and 7, wherein said injection means injects raw fluid and bubbling air.

12. (Canceled)

13. (Currently Amended) A method of cleaning a filter, comprising:  
providing a plurality of hollow fiber membranes in a filter case, the fibers having a first end bundled within a bundling-diameter and a second end that is free;  
enabling the free ends to spread within the filter case;  
injecting fluid and gas into a central portion of the plurality of hollow fiber membranes;  
[[and]]

causing the fluid and gas to radiate outwardly from the central portion;  
dislodging deposits from the hollow fiber membranes with the fluid and gas;  
directing the dislodged deposits through a funnel member in the filter case; and  
collecting the dislodged deposits in a recovery chamber inside the filter case after  
directing the dislodged deposits through the funnel member,  
wherein an inner diameter of the filter case is 1.5 to 3 times the bundling-diameter.

14. (Currently Amended) A filter device comprising:  
a plurality of hollow fiber membranes, having a bundled end bundled into a bundled-end diameter and a free end;  
a filter cylinder having an inner diameter between 1.5 and 3 times the bundled end diameter; and

injection means for injecting fluid and gas to a central portion of said plurality of hollow fiber membranes and causing the fluid and gas to radiate outwardly from the central portion, thereby injecting the fluid and gas to an interior of said filter cylinder under pressure;

a funnel member inside the filter cylinder and positioned beneath the plurality of hollow fiber membranes; and

a recovery chamber inside the filter cylinder and below the funnel member,  
wherein when in operation the free ends of the hollow fiber membranes spread out into a broom form by the action of the fluid and gas.

15. (New) The filter device of claim 2 wherein the funnel member defines a lower-end opening that facilitates fluid flow between the recovery chamber and a filter chamber above the funnel member.

16. (New) The filter device of claim 15 wherein the injection means is positioned to pass through the recovery chamber, through the lower-end opening and into the filter chamber.

17. (New) The filter member of claim 2 further comprising a valved pipe coupled to the recovery chamber to facilitate removal of deposits from the recovery chamber.